CA-132/132I

User's Manual

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CA-132/132I
User's Manual

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Introduction

Welcome to MOXA CA-132/132I Series of advanced 2-port RS-422/485 PC/104 communication modules, a new industrial multiport serial board solution. Both ports of CA-132/132I can be configured by DIP Switch for either the RS-422 or RS-485 interface, and with its PC/104 standard, the CA-132/132I Series is compatible with any PC/104 CPU module or CPU card that accepts PC/104 expansion modules.

The following topics are covered in this chapter:

- **Overview**
- **Package Checklist**
- **Product Features**
- **Product Specifications**

Overview

CA-132/132I is a PC/104 module that supports the RS-422/485 serial interfaces, and can be used with PC/104 CPU modules or CPU cards that accept PC/104 expansion modules. CA-132/132I has two independent serial interfaces, which are accessed through RJ45 connectors. You can configure both ports for the RS-422 or RS-485 interfaces by DIP switch. The module's industry-standard MOXA UART (16C550 compatible) is fully programmable. Moxa has implemented its patented ADDC™ technology for RS-485 automatic direction control, so there is no need to change jumpers to switch the module between driver and receiver. The built-in 16 KV ESD surge protection protects other devices connected to the RS-485 network.

Package Checklist

MOXA CA-132/132I products are shipped with the following items:

- 1 MOXA CA-132/132I 2-port serial board
- CA-132/132I Document & Software CD
- CA-132/132I Quick Installation Guide

NOTE: *Notify your sales representative if any of the above items is missing or damaged.*

Product Features

CA-132/132I Series products enjoy the following features:

- 2 RS-422/485 ports
- RS-422/485 communication distance up to 4000 feet (1.2 km)
- High speed data transmission rate up to 230.4 Kbps
- Switch selectable for I/O and INT Vector addresses (from Hex 000 to 3FF)
- 64-byte FIFOs
- IRQ settings are selectable by jumper
- Built-in 16 KV ESD surge protection for TX and RX lines
- 4 LED indicators onboard (red for TX, and green for RX)
- Support 4-wire RS-422 and 2/4-wire RS-485
- ADDC™ for RS-485 transmission
- CA-132I has 2 KV isolation protection

Product Specifications

CA-132/132I Series boards have the following specifications:

- Dimensions: 9.6 cm × 9.0 cm
- Bus: PC/104
- Baud rate: 50 to 230.4 Kbps
- Character length: 5, 6, 7, or 8 bits
- Parity: even, odd, none, mark, and space
- Stop bit: 1, 1.5 or 2
- I/O connectors: dual 8-pin RJ-45 connectors
- Interrupt levels: IRQ 3, 4, 5, 6, 7, 9, 10, 11, 12 or 15
- Clock input: 14.745 MHz
- Power consumption (+5 V): CA-132/190 mA, CA-132I/405 mA
- MTBF: 100,000 hrs @ 25℃ environment
- Operating temperature: 0 to 55℃

- Storage temperature: -20 to 85℃
- Relative humidity: 5 to 95%, non-condensing

2

Hardware Installation

This chapter includes information about hardware installation of CA-132/132I Series boards. The following topics are covered:

- **Hardware Installation**
- **Block Diagram of CA-132/132I**
- **RS-422/485 Interface Settings**
- **I/O Address & Interrupt Vector Settings**
- **IRQ Setting**
- **Initial Inspection**
- **RS-422/485 pin assignments**

Hardware Installation

The hardware installation of CA-132/132I serial boards is easy to carry out. Before you insert CA-132/132I into the PC/104 interface, you must first configure the RS-422/485 setting, I/O Base Address & Interrupt Vector, and IRQ Settings. Follow the detailed steps given below to install the CA-132/132I serial board in your computer.

Step 1: Configure the RS-422/485 setting, I/O Base Address & Interrupt Vector, and IRQ Settings (see details below).

ATTENTION

Safety First!

To avoid damaging your system and boards, make sure your PC's power is turned off before installing your CA-132/132I board.

Step 2: Turn your PC's power off, and also shut off the power to any peripheral devices, and remove the PC's cover.

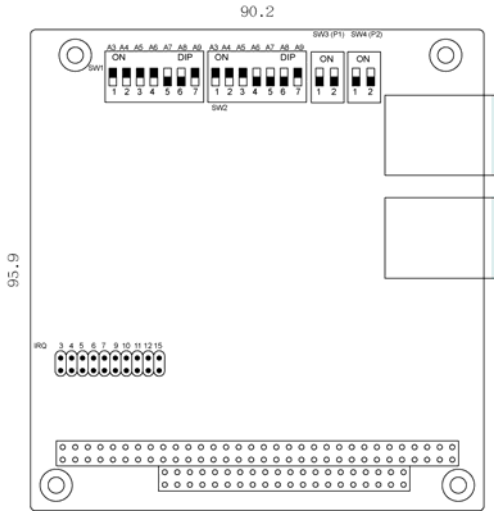
Step 3: Insert the CA-132/132I serial board into the PC/104 interface slot.

Step 4: Fasten the holding screw to fix the serial board in place.

Step 5: Replace the PC's cover.

Step 6: Power on the PC.

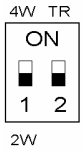
Block Diagram of CA-132/132I



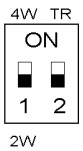
RS-422/485 Interface Settings

You can use DIP switches SW3 and SW4 to configure each port individually for either RS-422 (4-wire) or RS-485 (2/4-wire) interface with termination resistor on/off (120 ohm). SW3 configures Port 1, and SW4 configures Port 2, as shown in the switch setting diagrams below.

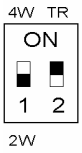
SW3 (P1)



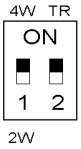
SW4 (P2)



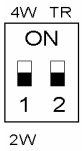
The following diagram shows how to use the DIP switches to configure each port for either RS-422 (4-wire) or RS-485 (2/4-wire) interface with or without termination resistor.



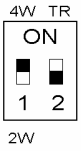
2-wire RS-485 with Termination Resistor



4-wire RS-485/422 with Termination Resistor



2-wire RS-485 without Termination Resistor



4-wire RS-485/422 without Termination Resistor

I/O Base Address & Interrupt Vector Settings

CA-132/132I Series have two 7-switch DIP switch panels, named SW1 and SW2. Panel SW1 is for I/O Base Address setting, and SW2 is for Interrupt Vector setting. Once you configure Port 1's I/O Base Address and Interrupt Vector, the settings for the other ports will be configured automatically as well. You can choose base addresses from hex 000 to 3FF. The default settings are CH#1 (Hex 180) for I/O Base Address and 1C0 for Interrupt Vector settings.

Example:

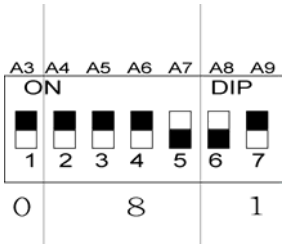
When you wish to configure your Port 1's I/O base address to 180, the DIP switch settings of panel SW1 should be as follows:

A3	A4	A5	A6	A7	A8	A9	Hex
On	On	On	On	Off	Off	On	0 × 180

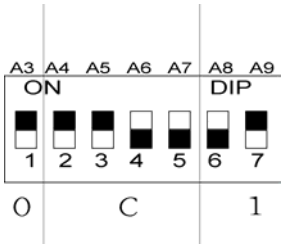
When you wish to configure your Port 1's INT Vector to 1C0, the DIP switch settings of panel SW2 should be as follows:

A3	A4	A5	A6	A7	A8	A9	Hex
On	On	On	Off	Off	Off	On	0 × 1C0

The following diagrams show the DIP switch settings of panel SW1 and panel SW2 when the I/O base address is configured to be 180, and the INT Vector is configured to be 1C0.



The diagram shown above is SW1 for setting I/O Base Address.



The diagram shown above is SW2 for setting INT Vector.

At this point, the start of I/O addresses of Port 2 will be automatically configured at 188.

A3	A4	A5	A6	A7	A8	A9	
8	1	2	4	8	1	2	Hex
On	On	On	On	On	On	On	0x000
On	On	On	On	On	On	Off	0x200
On	On	On	On	On	Off	Off	0x300
On	On	On	On	Off	Off	Off	0x380
On	On	On	Off	Off	Off	Off	0x3C0
On	On	Off	Off	Off	Off	Off	0x3E0
On	Off	Off	Off	Off	Off	On	0x3F0
Off	Off	Off	Off	Off	Off	Off	0x3F8
Off	On	On	On	On	On	On	0x008
Off	Off	On	On	On	On	On	0x018
Off	Off	Off	On	On	On	On	0x038
Off	Off	Off	Off	On	On	On	0x078
Off	Off	Off	Off	Off	On	On	0x0F8
Off	Off	Off	Off	Off	Off	On	0x2F8

IRQ Setting

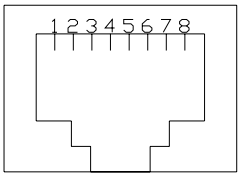
CA-132/132I Series has a jumper selectable function for you to configure IRQ settings. Before you insert a CA-132/132I board into the PC/104 interface, you need to choose an available jumper from 3, 4, 5, 6, 7, 9, 10, 11, 12, or 15 to configure the IRQ setting.

Initial Inspection

Before we ship CA-132/132I products, we first perform a careful mechanical and electrical inspection of these serial boards. Products should be free of any marks or scratches and in perfect electrical order when customers receive them. Handle these boards only by their edges, since the static charge from your body may damage the integrated circuits. Always keep the boards in their anti-static package whenever they are not installed. You can also use this package to return the board should it need to be repaired.

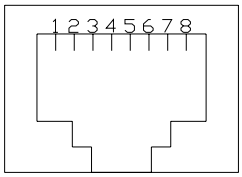
RS-422/485 Pin Assignments

Async Port 4-wire RS-422 Pin Assignment (RJ45)



PIN	SIGNAL
1	X
2	X
3	TXD+
4	TXD-
5	RXD-
6	RXD+
7	GND
8	X

Async Port 2-wire RS-485 Pin Assignment (RJ45)



PIN	SIGNAL
1	X
2	X
3	X
4	X
5	DATA-
6	DATA+
7	GND
8	X

3

Software Installation

After installing the CA-132/132I serial boards in your computer, the next step is to install the software. The drivers for CA-132/132I support various operating systems, including Window NT, Windows 2000/XP/2003, and Windows 95/98/Me. This chapter includes information about how to install and remove the CA-132/132I board.

The following topics are covered in this chapter:

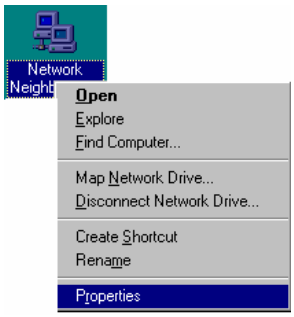
- **Windows NT**
- **Windows 2000/XP/2003**
- **Windows 95/98/Me**

Windows NT

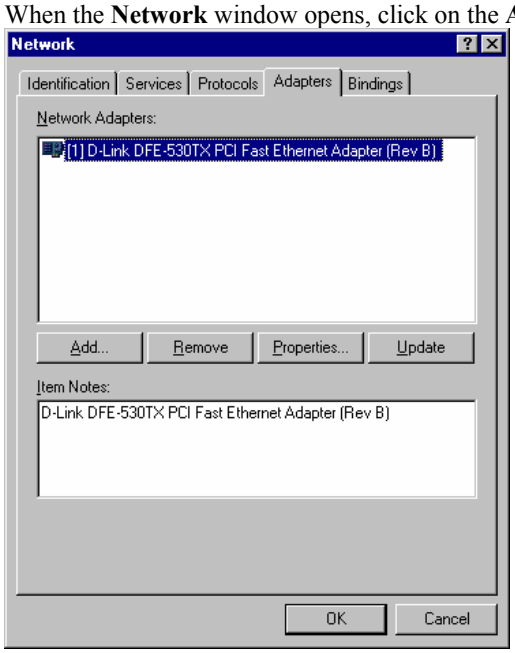
Installing the driver

The following procedure is for installing the CA-132/132I serial board driver under Windows NT 4.0.

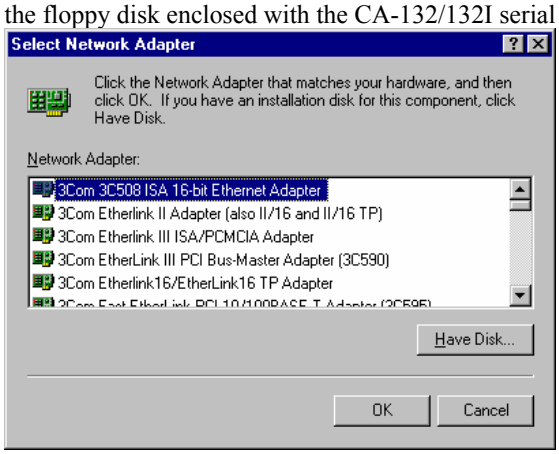
1. Use the mouse to position the cursor over your desktop's **Network** icon**,** and then click the right mouse button. Select **Properties** and then click the left mouse button.



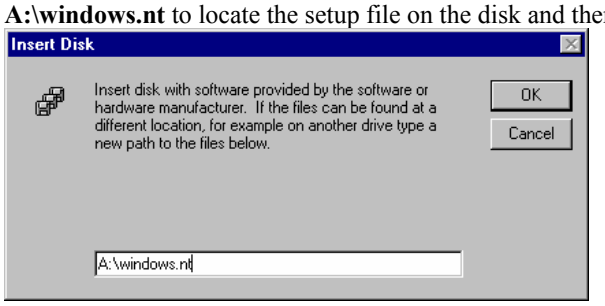
2. When the **Network** window opens, click on the **Adapters** tab and then click on **Add**.



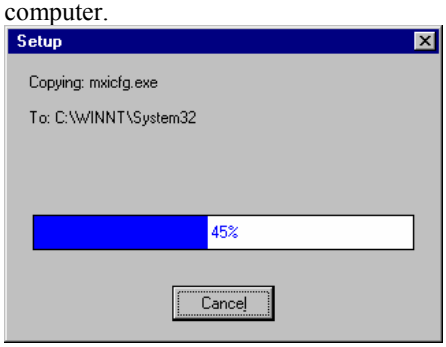
3. When the **Select Network Adapter** window opens, click on **Have Disk** to install the driver from the floppy disk enclosed with the CA-132/132I serial board.


Select Network Adapter
Click the Network Adapter that matches your hardware, and then click OK. If you have an installation disk for this component, click Have Disk.
Network Adapter:
3Com 3C508 ISA 16-bit Ethernet Adapter
3Com Etherlink II Adapter (also II/16 and II/16 TP)
3Com Etherlink III ISA/PCMCIA Adapter
3Com EtherLink III PCI Bus-Master Adapter (3C590)
3Com Etherlink16/EtherLink16 TP Adapter
Have Disk...
OK
Cancel

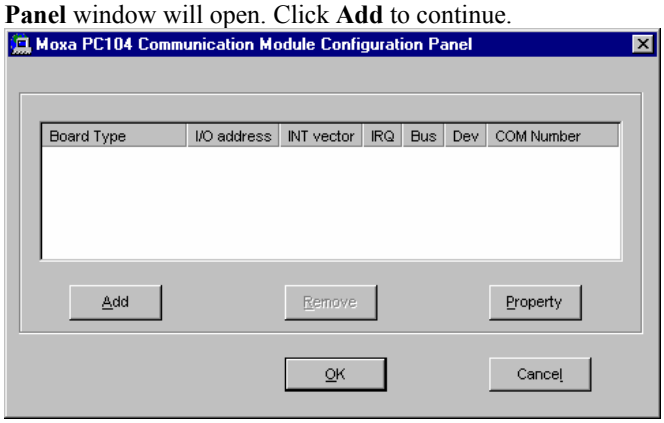
4. The **Insert Disk** window will open asking you to insert the disk into your computer. Type **A:\windows.nt** to locate the setup file on the disk and then click **OK**.


Insert Disk
Insert disk with software provided by the software or hardware manufacturer. If the files can be found at a different location, for example on another drive type a new path to the files below.
OK
Cancel
A:\windows.nt

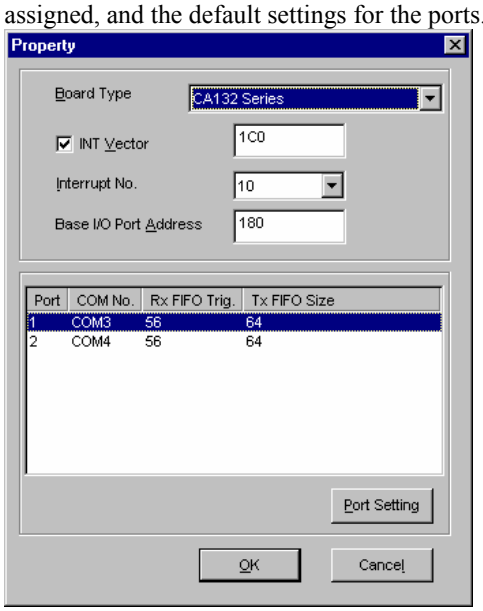
5. The **Setup** window will open, showing that the computer is copying the setup file to your computer.



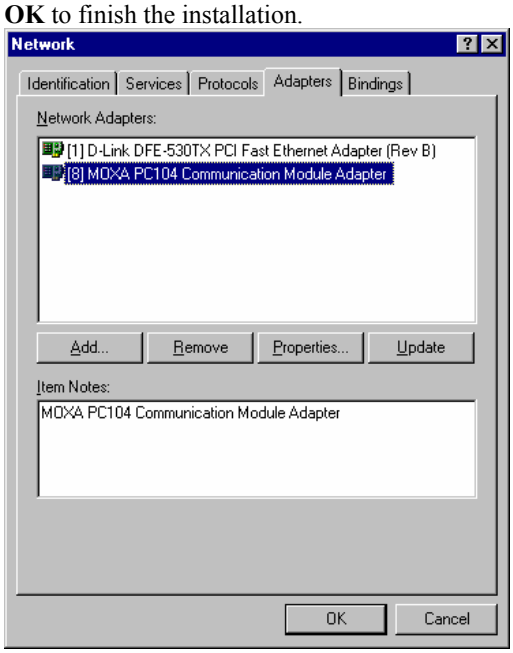
6. After the setup file has been copied, the **Moxa PC104 Communication Module Configuration Panel** window will open. Click **Add** to continue.



7. When the **Property** window opens, select **CA132 Series** or **CA132I Series** under **Board Type**. The window will show the COM port number to which the serial ports of CA-132/CA-132I are assigned, and the default settings for the ports. Click **OK** to continue.

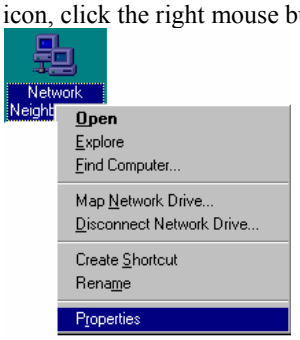


8. The **Network** window will open, showing the serial board you just added to your computer. Click **OK** to finish the installation.

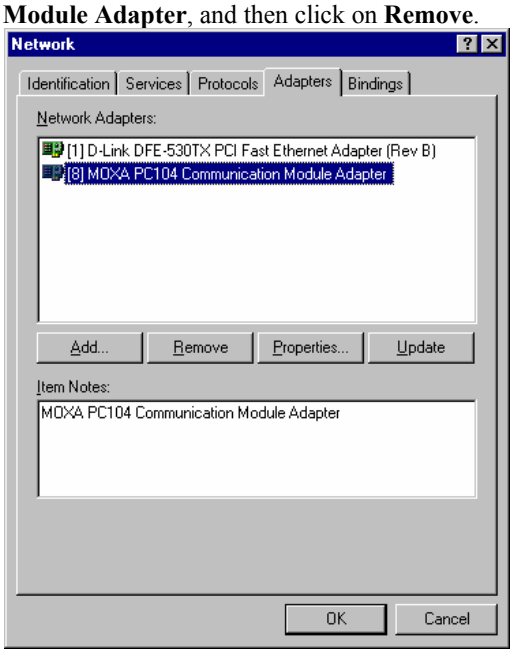


Removing a CA-132/132I serial board

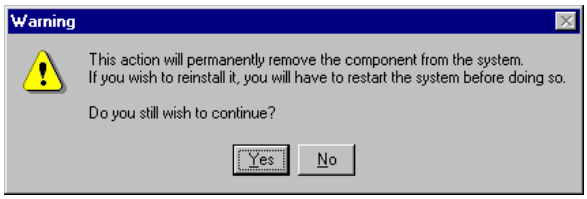
1. If you wish to remove a CA-132/132I serial board, move your mouse to your desktop's **Network** icon, click the right mouse button, and then select **Properties**.



2. When the **Network** window opens, choose **Adapters,** select **MOXA PC104 Communication Module Adapter**, and then click on **Remove**.



3. A **Warning** window will open. Click **Yes** if you wish to remove the CA-132/132I serial board.

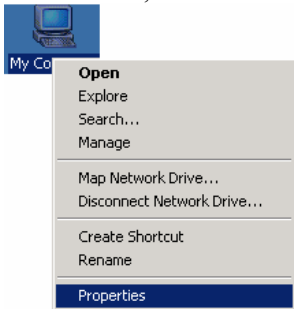

Warning
This action will permanently remove the component from the system.
If you wish to reinstall it, you will have to restart the system before doing so.
Do you still wish to continue?
Yes
No

Windows 2000/XP/2003

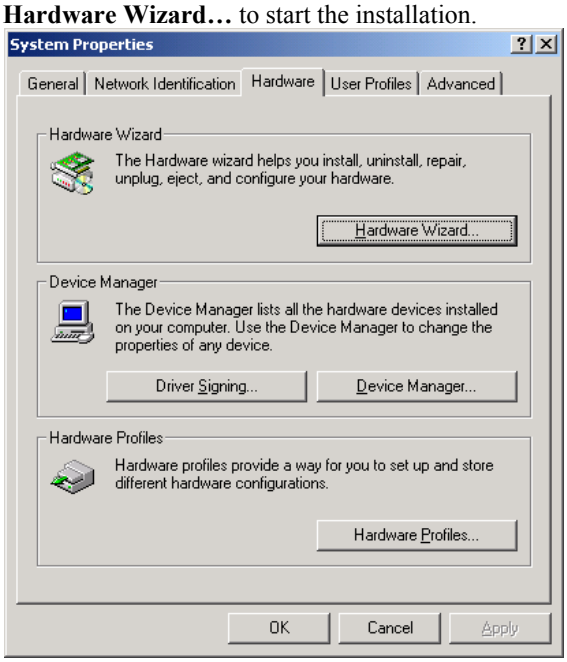
Installing the driver

The following procedure explains how to install the CA-132/132I serial board driver under Windows 2000/XP/2003.

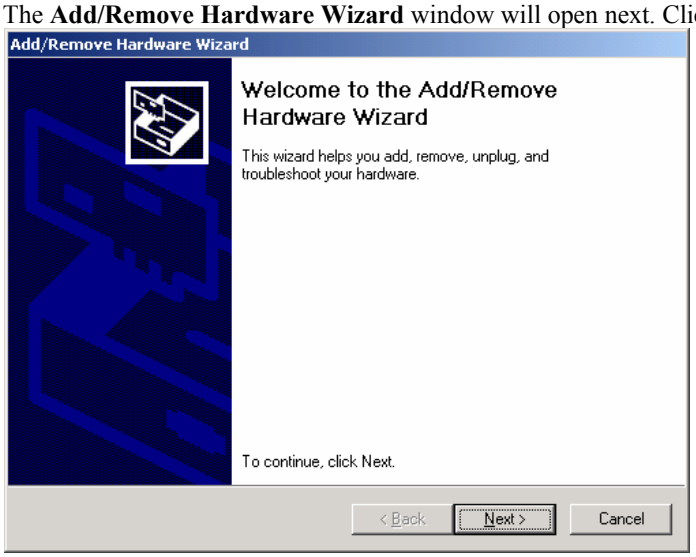
1. Use your mouse to position the cursor over your desktop's **My Computer** icon, click the right mouse button, and then select **Properties**.



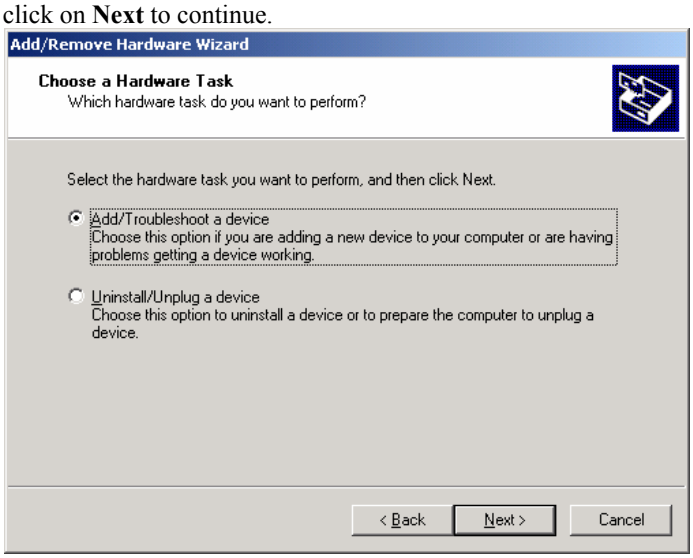
2. When the **System Properties** window opens, click on the **Hardware** tab, and then click on **Hardware Wizard…** to start the installation.


System Properties
General
Network Identification
Hardware
User Profiles
Advanced
Hardware Wizard
The Hardware wizard helps you install, uninstall, repair, unplug, eject, and configure your hardware.
Hardware Wizard...
Device Manager
The Device Manager lists all the hardware devices installed on your computer. Use the Device Manager to change the properties of any device.
Driver Signing...
Device Manager...
Hardware Profiles
Hardware profiles provide a way for you to set up and store different hardware configurations.
Hardware Profiles...
OK
Cancel
Apply

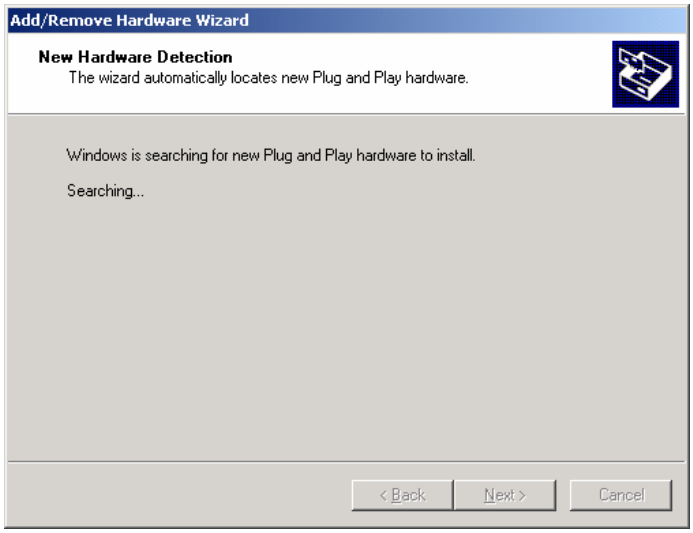
3. The **Add/Remove Hardware Wizard** window will open next. Click on **Next** to continue.


Add/Remove Hardware Wizard
Welcome to the Add/Remove Hardware Wizard
This wizard helps you add, remove, unplug, and troubleshoot your hardware.
To continue, click Next.
< Back
Next >
Cancel

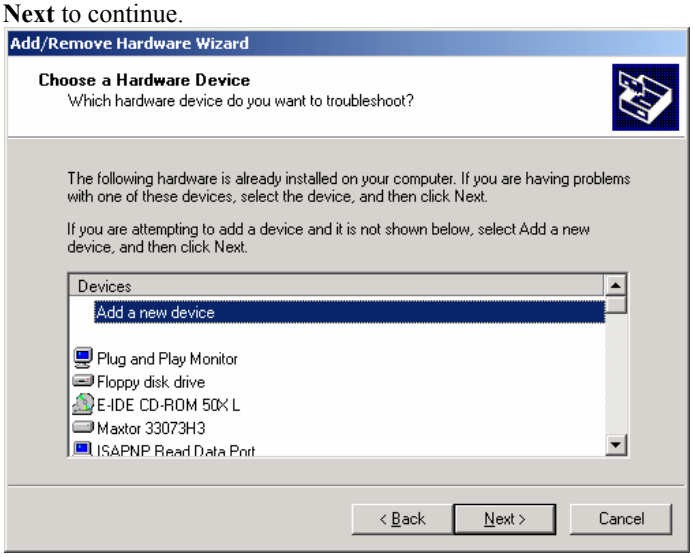
4. When the **Choose a Hardware Task** window opens, select **Add/Troubleshoot a device**, and then click on **Next** to continue.


Add/Remove Hardware Wizard
Choose a Hardware Task
Which hardware task do you want to perform?
Select the hardware task you want to perform, and then click Next.
Add/Troubleshoot a device
Choose this option if you are adding a new device to your computer or are having problems getting a device working.
Uninstall/Unplug a device
Choose this option to uninstall a device or to prepare the computer to unplug a device.
< Back
Next >
Cancel

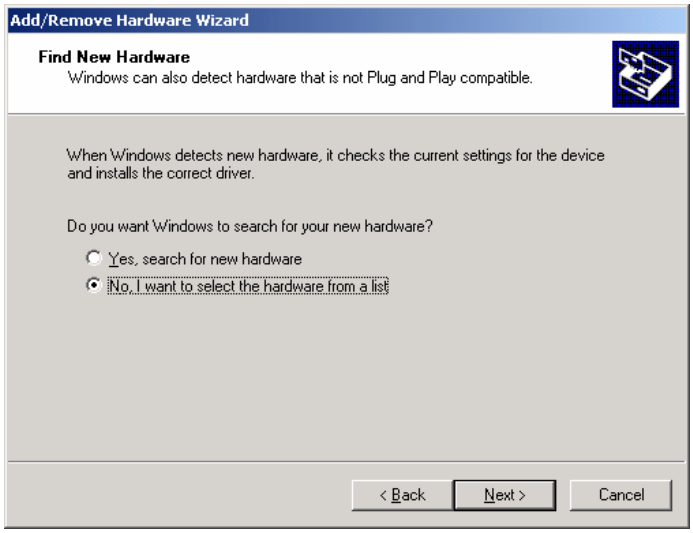
5. The **New Hardware Detection** window will open showing that the Wizard is searching for the CA-132/CA-132I serial board on your computer.


Add/Remove Hardware Wizard
New Hardware Detection
The wizard automatically locates new Plug and Play hardware.
Windows is searching for new Plug and Play hardware to install.
Searching...
< Back
Next >
Cancel

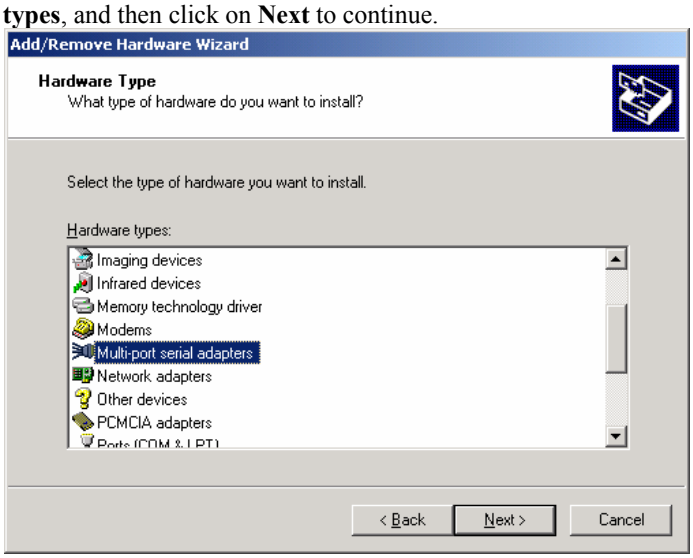
6. When the **Choose a Hardware Device** window opens, select **Add** a new device and then click **Next** to continue.


Add/Remove Hardware Wizard
Choose a Hardware Device
Which hardware device do you want to troubleshoot?
The following hardware is already installed on your computer. If you are having problems with one of these devices, select the device, and then click Next.
If you are attempting to add a device and it is not shown below, select Add a new device, and then click Next.
Devices
Add a new device
Plug and Play Monitor
Floppy disk drive
E-IDE CD-ROM 50X L
Maxtor 33073H3
ISAPNP Read Data Port
< Back
Next >
Cancel

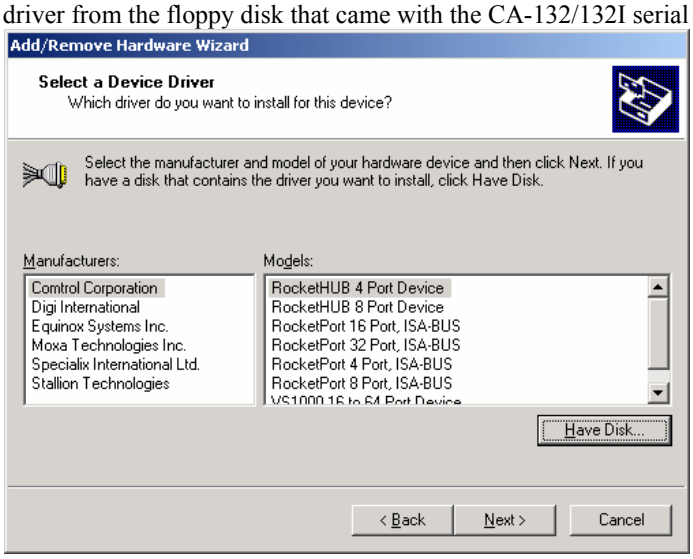
7. The **Find New Hardware** window will open next. Select **No, I want to select the hardware from a list**, since CA-132/132I is a brand new type of ISA serial board, and then click on **Next** to continue.


Add/Remove Hardware Wizard
Find New Hardware
Windows can also detect hardware that is not Plug and Play compatible.
When Windows detects new hardware, it checks the current settings for the device and installs the correct driver.
Do you want Windows to search for your new hardware?
Yes, search for new hardware
No, I want to select the hardware from a list
< Back
Next >
Cancel

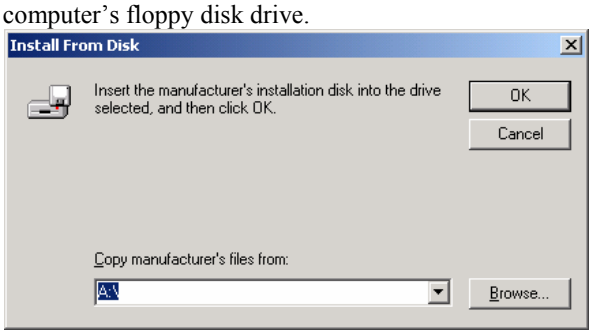
8. When the **Hardware Type** window opens, select **Multi-port serial adapters** under **Hardware types**, and then click on **Next** to continue.



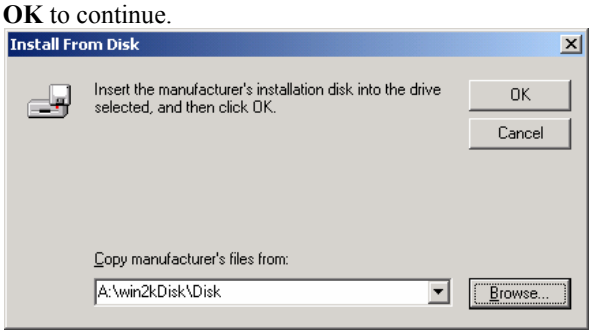
9. When the **Select a Device Driver** window opens, click on **Have Disk** to install the CA-132/132I driver from the floppy disk that came with the CA-132/132I serial board.


Add/Remove Hardware Wizard
Select a Device Driver
Which driver do you want to install for this device?
Select the manufacturer and model of your hardware device and then click Next. If you have a disk that contains the driver you want to install, click Have Disk.
Manufacturers:
Comtrol Corporation
Digi International
Equinox Systems Inc.
Moxa Technologies Inc.
Specialix International Ltd.
Stallion Technologies
Models:
RocketHUB 4 Port Device
RocketHUB 8 Port Device
RocketPort 16 Port, ISA-BUS
RocketPort 32 Port, ISA-BUS
RocketPort 4 Port, ISA-BUS
RocketPort 8 Port, ISA-BUS
Have Disk...
< Back
Next >
Cancel

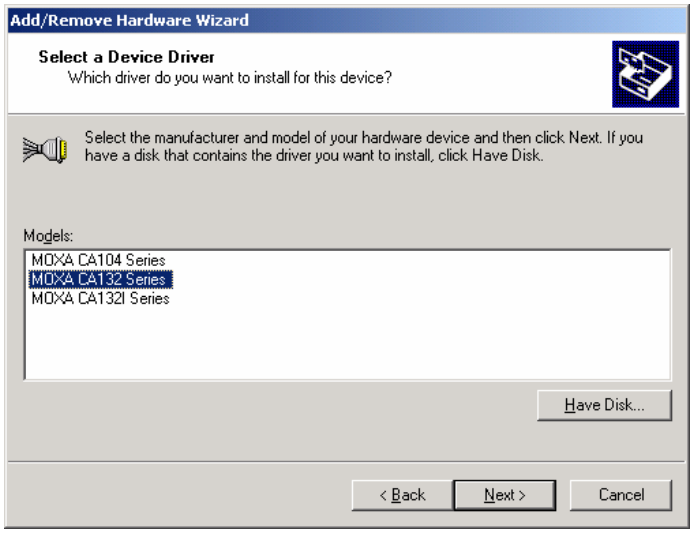
10. The **Install from Disk** window that opens will prompt you to insert the installation disk into your computer's floppy disk drive.



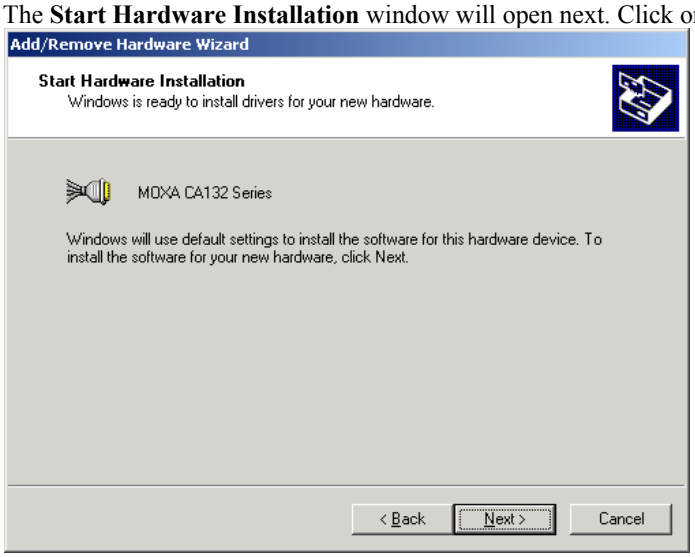
11. After inserting the installation disk, click on **Browse** to locate the setup file from the disk. Click **OK** to continue.



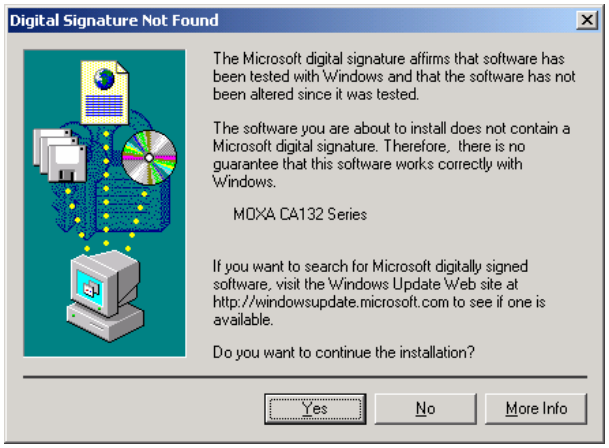
12. When the **Select a Device Driver** window opens, select **MOXA CA132 Series** or **MOXA CA132I Series** and then click **Next** to continue.


Add/Remove Hardware Wizard
Select a Device Driver
Which driver do you want to install for this device?
Select the manufacturer and model of your hardware device and then click Next. If you have a disk that contains the driver you want to install, click Have Disk.
Models:
MOXA CA104 Series
MOXA CA132 Series
MOXA CA132I Series
Have Disk...
< Back
Next >
Cancel

13. The **Start Hardware Installation** window will open next. Click on **Next** to continue.

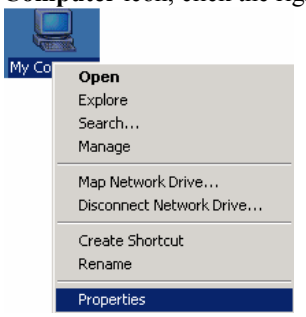

Add/Remove Hardware Wizard
Start Hardware Installation
Windows is ready to install drivers for your new hardware.
MOXA CA132 Series
Windows will use default settings to install the software for this hardware device. To install the software for your new hardware, click Next.
< Back
Next >
Cancel

14. A **Digital Signature Not Found** window will open. Although this message states that MOXA CA132 Series (or CA132I Series if you choose it) driver does not contain a Microsoft digital signature, the CA132 Series driver has already been tested and been shown that it can support Windows OS. Click **Yes** to continue the installation.

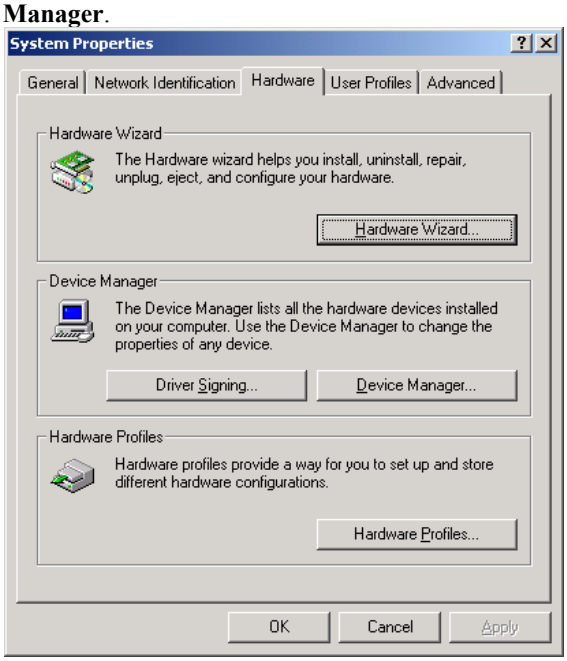

Digital Signature Not Found
The Microsoft digital signature affirms that software has been tested with Windows and that the software has not been altered since it was tested.
The software you are about to install does not contain a Microsoft digital signature. Therefore, there is no guarantee that this software works correctly with Windows.
MOXA CA132 Series
If you want to search for Microsoft digitally signed software, visit the Windows Update Web site at http://windowsupdate.microsoft.com to see if one is available.
Do you want to continue the installation?
Yes
No
More Info

15. The next window to open states that the installation is completed. Click **Finish** to end the installation.

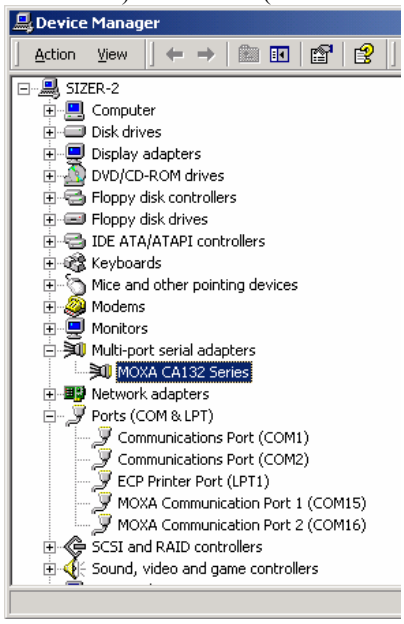
16. After the installation is completed, use your mouse to position the cursor over your desktop's **My Computer** icon, click the right mouse button, and then select **Properties**.



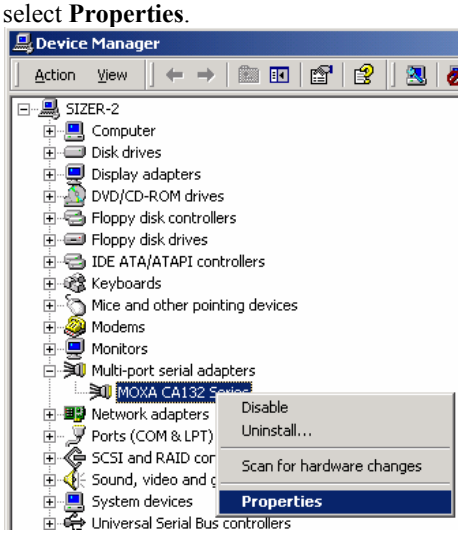
17. When the **System Properties** window opens, click on the **Hardware** tab, and then click on **Device Manager**.


System Properties
General
Network Identification
Hardware
User Profiles
Advanced
Hardware Wizard
The Hardware wizard helps you install, uninstall, repair, unplug, eject, and configure your hardware.
Hardware Wizard...
Device Manager
The Device Manager lists all the hardware devices installed on your computer. Use the Device Manager to change the properties of any device.
Driver Signing...
Device Manager...
Hardware Profiles
Hardware profiles provide a way for you to set up and store different hardware configurations.
Hardware Profiles...
OK
Cancel
Apply

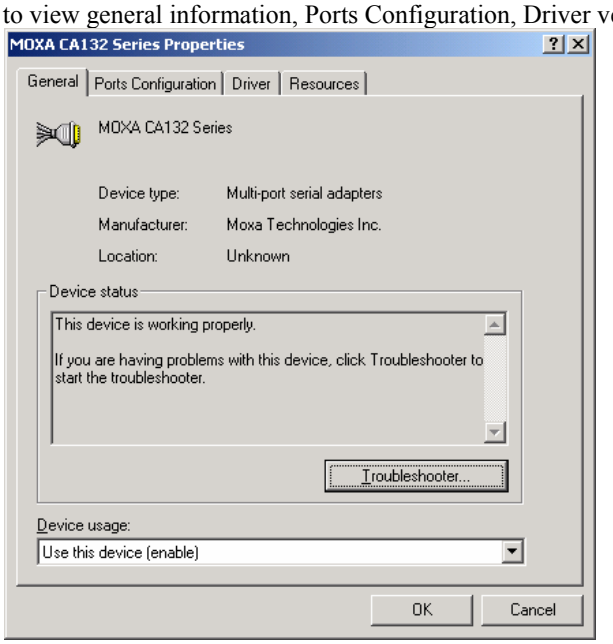
18. The **Device Manager** window will open next. At this point, you should be able to find MOXA CA132 Series/MOXA CA132I Series under Multi-port serial adapters, and MOXA communication Port 1 and Port 2 (assigned to COM 15 and COM 16, respectively, for the example shown here) under Ports (COM & LPT).



19. Select **MOXA CA132 Series/MOXA CA132I Series**, click the right mouse button, and then select **Properties**.

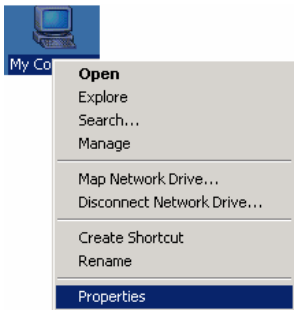


20. The **MOXA CA132 Series/MOXA CA132I Series Properties** window will open, allowing you to view general information, Ports Configuration, Driver version, and Resource Settings.

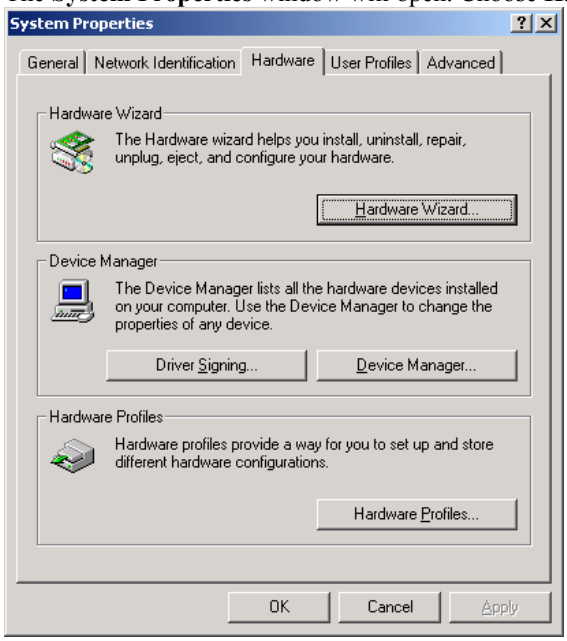


Disabling the device

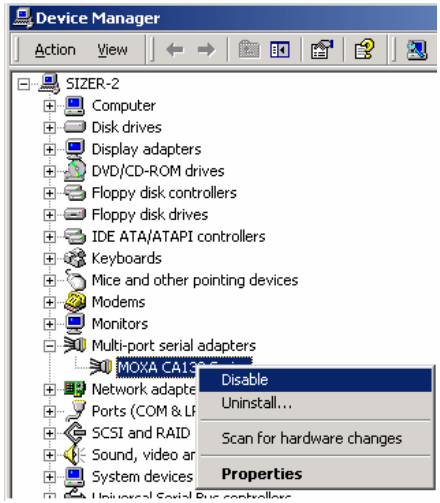
1. Use your mouse to position the cursor over you desktop's **My Computer** icon, click the right mouse button, and then select **Properties**.



2. The **System Properties** window will open. Choose **Hardware** and select **Device Manager**.


System Properties
General
Network Identification
Hardware
User Profiles
Advanced
Hardware Wizard
The Hardware wizard helps you install, uninstall, repair, unplug, eject, and configure your hardware.
Hardware Wizard...
Device Manager
The Device Manager lists all the hardware devices installed on your computer. Use the Device Manager to change the properties of any device.
Driver Signing...
Device Manager...
Hardware Profiles
Hardware profiles provide a way for you to set up and store different hardware configurations.
Hardware Profiles...
OK
Cancel
Apply

3. The **Device Manager** window will open. Select **MOXA CA132 Series/MOXA CA132I Series** under **Multi-port serial adapters**, and click on the right mouse button. Select **Disable** and click on the left mouse button to disable the device.



Uninstalling the device

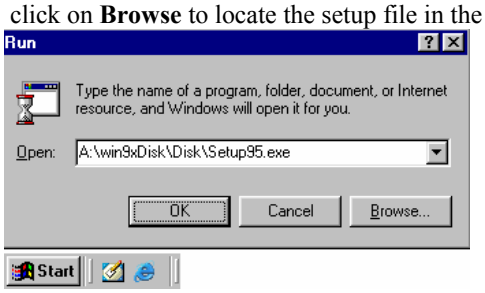
1. Follow steps 1 and 2 of **Disabling the device**.
2. Select **MOXA CA132 Series/MOXA CA132I Series** under **Multi-port serial adapters**, click the right mouse button, and then select **Uninstall**.
3. A Warning window will open. Click **OK** to uninstall the device.

Windows 95/98/ME

Installing the driver

The following is for installing the driver of CA-132/132I serial boards under Windows 95/98/ME.

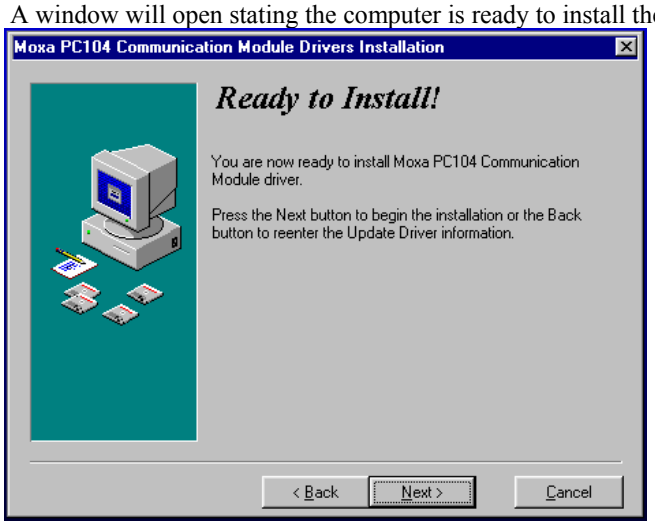
1. Insert the installation disk into your computer. Click on **Run** under the **Start Menu**, and then click on **Browse** to locate the setup file in the disk, or directly type in the path.



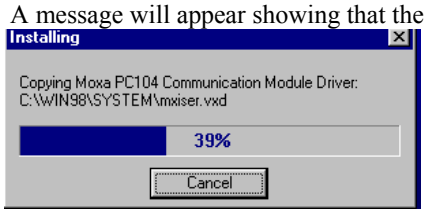
2. A Welcome message will appear. Click **Next** to continue.

Moxa PC104 Communication Module Drivers Installation
Welcome!
This installation program is about to install Moxa Smartio/Industio driver to your system.
Press the Next button to start the installation. You can press the Cancel button now if you don't want to proceed further installation procedure.
Next >
Cancel

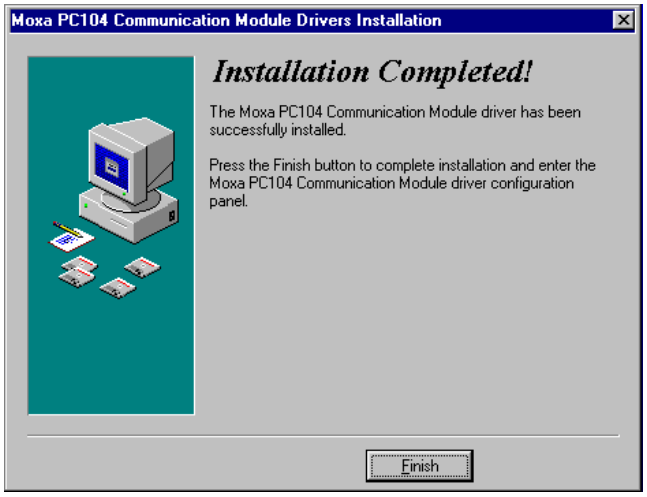
3. A window will open stating the computer is ready to install the driver. Click on **Next** to continue.


Moxa PC104 Communication Module Drivers Installation
Ready to Install!
You are now ready to install Moxa PC104 Communication Module driver.
Press the Next button to begin the installation or the Back button to reenter the Update Driver information.
< Back
Next >
Cancel

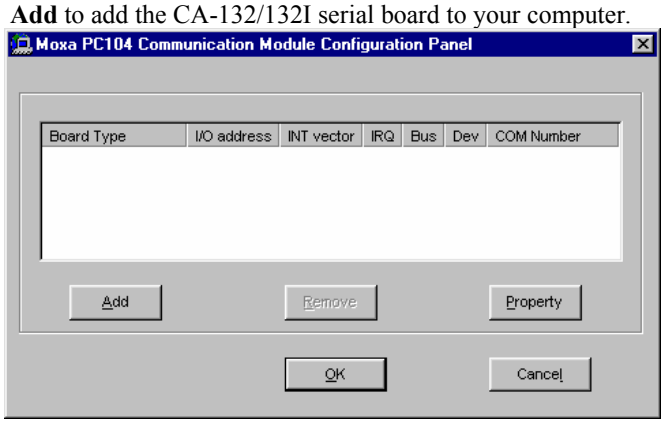
4. A message will appear showing that the setup file is being installed.



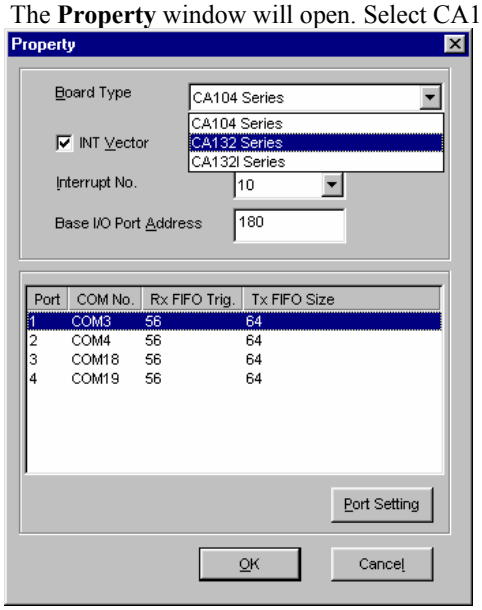
5. A window will appear showing that the installation is completed. Click on **Finish** to end the installation.


Moxa PC104 Communication Module Drivers Installation
Installation Completed!
The Moxa PC104 Communication Module driver has been successfully installed.
Press the Finish button to complete installation and enter the Moxa PC104 Communication Module driver configuration panel.
Finish

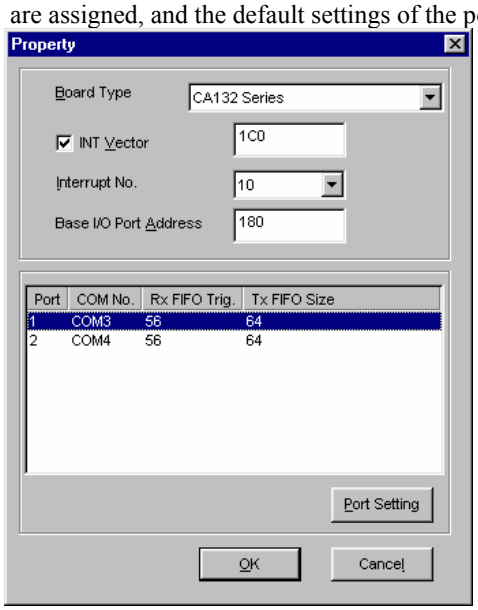
6. The **Moxa PC104 Communication Module Configuration Panel** window will appear. Click on **Add** to add the CA-132/132I serial board to your computer.



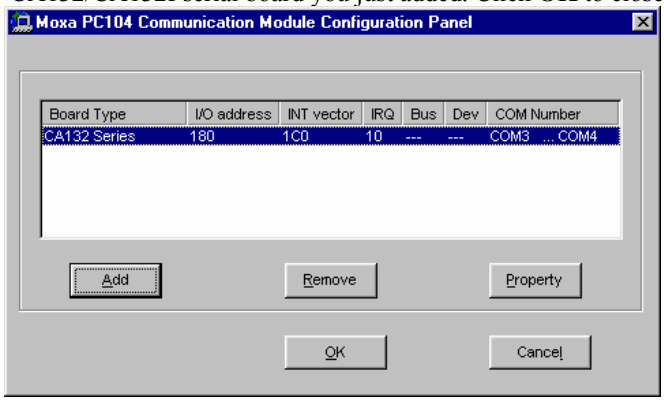
7. The **Property** window will open. Select CA132 Series/CA132I Series under **Board Type**.



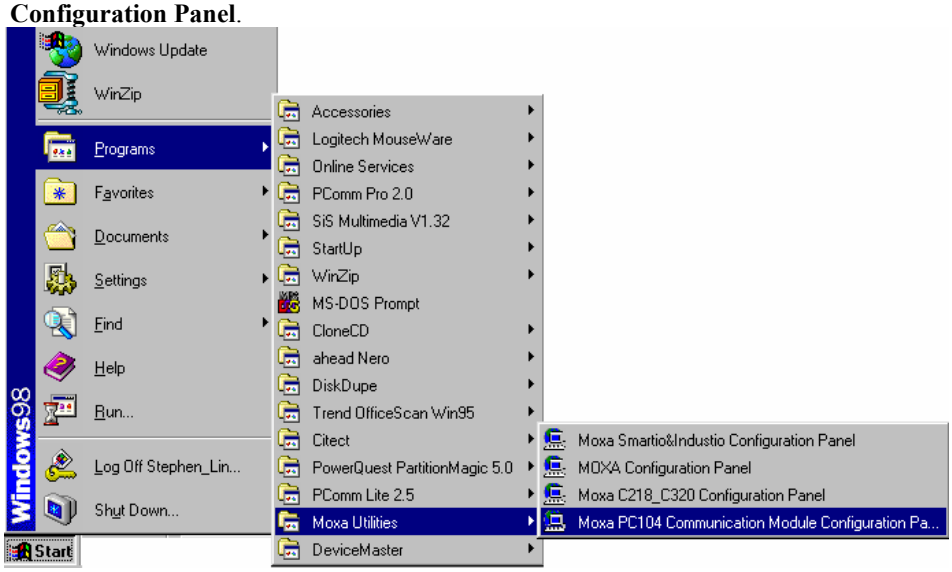
8. The **Property** window will show the COM port number to which the serial ports of CA-132/132I are assigned, and the default settings of the ports. Click **OK** to continue.



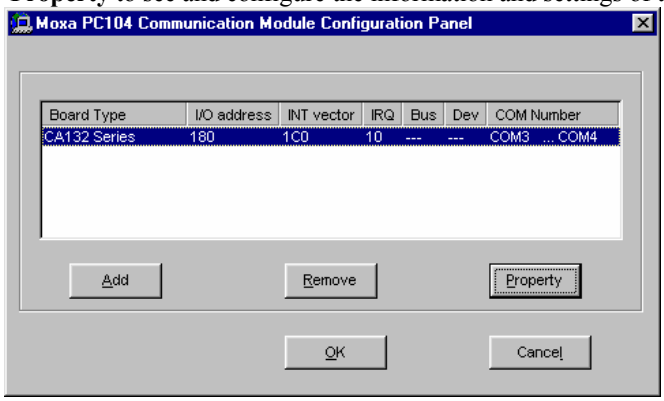
9. The **Moxa PC104 Communication Module Configuration Panel** window will show the CA132/CA132I serial board you just added. Click **OK** to close the window.



10. To open the **Moxa PC104 Communication Module Configuration Panel** window , click on **Start → Programs → Moxa Untilities → MOXA PC104 Communication Module Configuration Panel**.

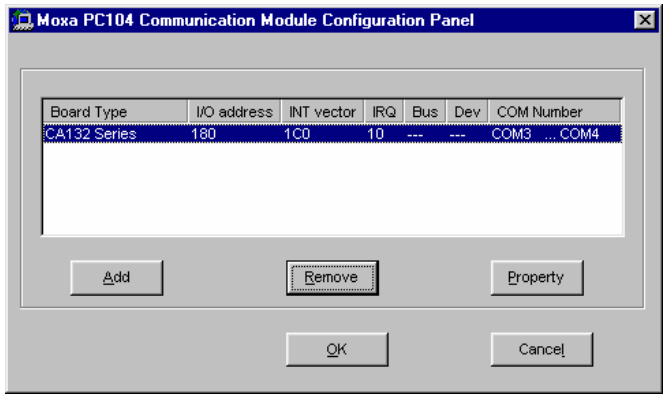


11. The **Moxa PC104 Communication Module Configuration Panel** window will open allowing you to see the CA132 Series/CA132I Series serial board you just added. You can click on **Property** to see and configure the information and settings of the board's COM ports.

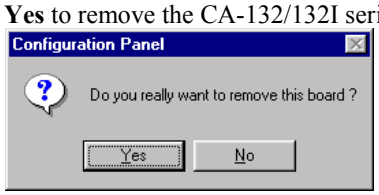


Removing the device

1. If you wish to remove the device, follow steps 11 and 12 of **Installing the driver**. Click on **Remove** when the **Moxa PC104 Communication Module Configuration Panel** opens.



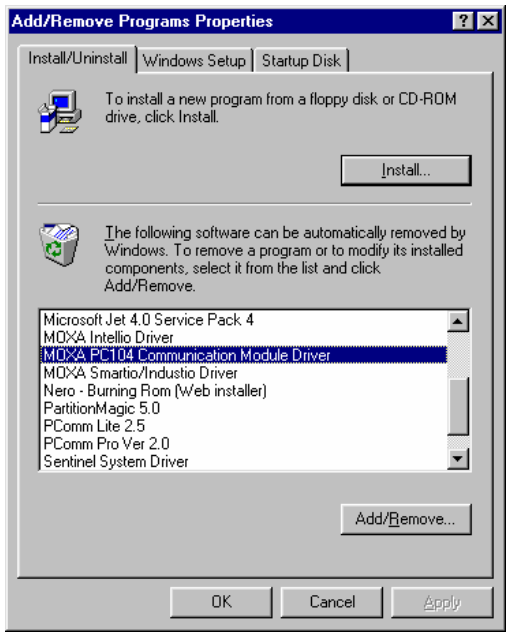
2. A warning message will appear asking you if you really want to remove this board. Click on **Yes** to remove the CA-132/132I serial board.



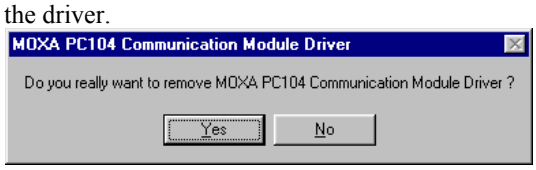
Uninstalling the driver

1. Click on **Start → Settings → Control Panel**.
2. Select **Add/Remove Programs**.

Choose **Install/Uninstall**, select **MOXA PC104 Communication Module Driver**, and then click **Add/Remove** to uninstall the driver.


Add/Remove Programs Properties
Install/Uninstall
Windows Setup
Startup Disk
To install a new program from a floppy disk or CD-ROM drive, click Install.
Install...
The following software can be automatically removed by Windows. To remove a program or to modify its installed components, select it from the list and click Add/Remove.
Microsoft Jet 4.0 Service Pack 4
MOXA Intellio Driver
MOXA PC104 Communication Module Driver
MOXA Smartio/Industio Driver
Nero - Burning Rom (Web installer)
PartitionMagic 5.0
PComm Lite 2.5
PComm Pro Ver 2.0
Sentinel System Driver
Add/Remove...
OK
Cancel
Apply

3. A message will appear asking you if you really want to remove the driver. Click **Yes** to uninstall the driver.



4. A message will prompt up confirming that the uninstallation of the driver is completed. Click **OK** to close the window.

4

Serial Programming Tool

Moxa supports a class of easy to use, yet powerful serial programming libraries and communication troubleshooting utilities under Windows NT/2000/XP/2003 and Windows 95/98/Me. Use these MOXA Serial Programming Tools to decrease your software development time. In the following sections, we describe the installation of the library, and the utilities supported for various programming platforms. *PComm*, a professional serial comm tool for PCs, is a software package that runs under Windows NT/2000/XP/2003 and Windows 95/98/Me. *PComm* provides:

- A powerful serial communication library for easy programming in the most popular programming languages. The serial communication library is useful for developing applications for data communications, remote access, data acquisition, and industrial control under Windows NT/2000/XP/2003 or Windows 95/98/Me. It is a simpler solution compared to the more complex Windows Win32 COMM API.
- Useful utilities such as diagnostic, monitor, and terminal emulator.
- Illustrative sample programs,
- Comprehensive on-line documentation.

The following topics are covered in this chapter:

- **PComm Installation**
- **PComm Programming Library**
- **Utilities**

PComm Installation

To install *PComm*, run \Setup.exe from the diskette enclosed in the package. Please note that the *PComm* diagnostic and monitor utilities are for MOXA boards only; these two utilities will not work with other manufacturer's serial boards.

PComm Programming Library

The serial communication library assists you in developing serial communications programs for any COM port that complies with Microsoft Win32 API. It facilitates the implementation of multi-process and multi-thread serial communication programs and hence remarkably reduces development time.

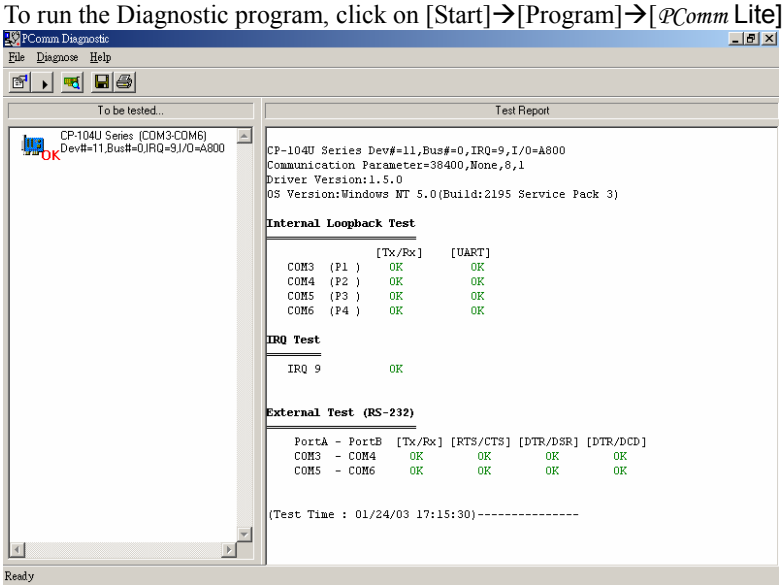
This serial communication library provides a complete function library and sample programs for Visual C++, Visual Basic, and Delphi. To view detailed function descriptions and sample programs, click on [Start] → [Program] → [*PComm* Lite] → [*PComm* Lib Help], [*PComm* Porting Notes] or [*PComm* Programming Guide], or refer to the sample programs in the *PComm* directory.

Utilities

In this section, we give brief descriptions of each utility. For more information about these utilities, see the on-line help from the software diskette.

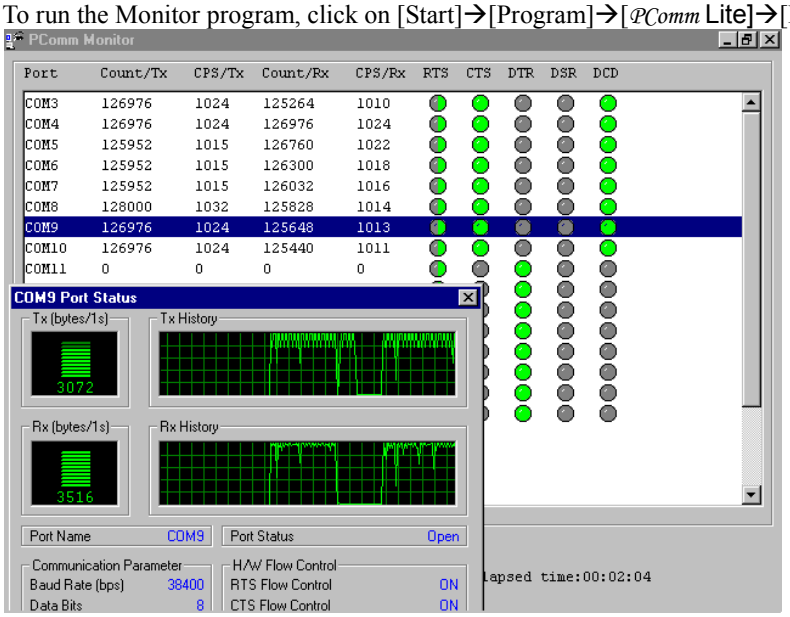
Diagnostic (for MOXA boards only)

A convenient diagnostic program, ONLY for MOXA boards and ports, provides internal and external testing of IRQ, TxD/RxD, UART, CTS/RTS, DTR/DSR, DTR/DCD, etc. It allows the user to check the function of both software and hardware.
To run the Diagnostic program, click on [Start]→[Program]→[*PComm* Lite]→[Diagnostic].



Monitor (for MOXA boards under Windows NT Only)

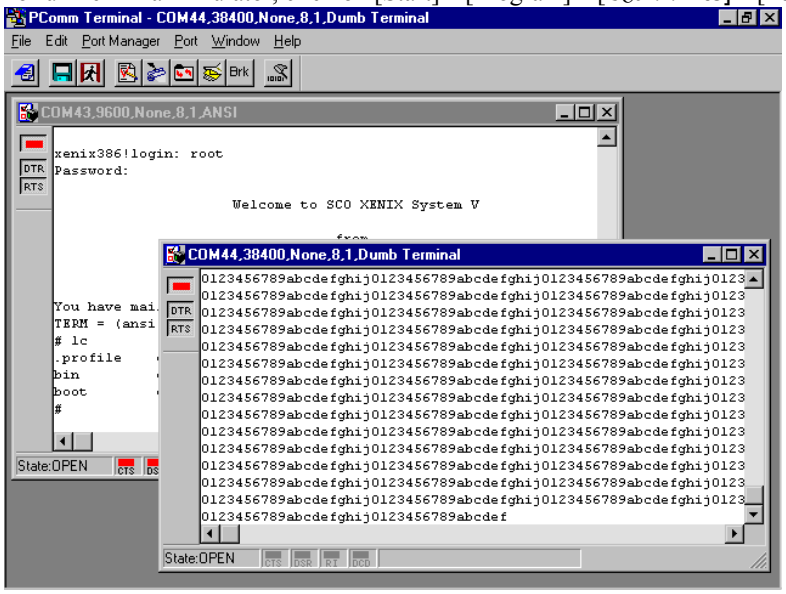
A useful port status monitoring program allows you to monitor data transmission of selected MOXA COM ports. It monitors data transmission/receiving throughput, and communication line status, with data updated and displayed on the screen at regular time intervals. Click on a specific port to see a graph of the current communication parameters and status of that port.
To run the Monitor program, click on [Start]→[Program]→[*PComm* Lite]→[Monitor].



Terminal Emulator

Terminal Emulator can be used to connect to various ports to see if data transmission is functioning correctly. Terminal Emulator features multi-windows, and supports VT100 and ANSI terminal types. You can transfer data interactively, send patterns periodically, and transfer files using ASCII, XMODEM, YMODEM, ZMODEM, and KERMIT protocols.

To run Terminal Emulator, click on [Start]→[Program]→[*PComm* Lite]→[Terminal Emulator].



RS-485 Programming

If you intend to do RS-485 communication with CA-132/132I Series boards, please follow the RS-485 programming guide below and also refer to the chapter, "**Connection Cable and Cable Wiring"**, for more RS-485 operation details.
The CA-132/132I Series supports **only 2-wire half-duplex RS-485 communication**. Data+/- pins are used for both data transmitting and receiving, depending on the mode selected: either **Automatic Data Direction Control** or **By RTS**.

By RTS Mode (For back-compatibility)

If the mode switch for the port is set to the **OFF** position, By RTS Mode is used. The port is ready for transmitting data if **RTS signal is asserted** and ready for receiving data if **RTS signal is not asserted**. **RTS** scheme is the traditional method, and is suitable for most systems, including Windows NT, Windows 95/98 and DOS, or even UNIX, that permits RTS control from application programs. This mode should be compatible with most existing RS-485 applications.

How to transmit and receive data for Windows NT, 95/98

We recommend you to configure CA-132/132I Series ports as follows in order to acquire precise timing control in RS-485 2-wire transmission. There are 2 solutions to control RS-485 2-wire transmission.

Solution 1

The following model is common in RS-485 2-wire transmission.

sio_SetWriteTimeouts(port, 0)	**/* Set sio_write() into block mode if for Windows NT and Windows 95/98 */**
sio_RTS(port, 1)	**/* Turn on RTS signal. The RS-485 port is ready for transmitting data. */**
sio_write(port, buff, 10)	**/* Write 10 byte characters in "buff". The function blocks until last character transmitted */**
sio_RTS(port, 0)	**/* Turn off RTS signal. The RS-485 port is ready for receiving data. */**
sio_read(port, buff, 10)	**/* Read 10 bytes */**

Solution 2

There is a dedicated RS-485 function in *PComm* library. It integrates the above functions of solution 1 regarding sending data as one.

sio_putb_x(port, buff, tick); /*	**1. Turn on RTS and ready for transmitting data. 2. Send data. 3. Wait for tick time. 4. Turn off RTS and ready for receiving data. */**

For more information on these functions, please refer to *PComm* library on-line Help file for Windows NT and Windows 95/98 respectively.

A

Service Information

This appendix shows you how to contact Moxa for information about this and other products, and how to report problems.

In this appendix, we cover the following topics.

- **MOXA Internet Services**
- **Problem Report Form**
- **Product Return Procedure**

MOXA Internet Services

Customer satisfaction is our number one concern, and to ensure that customers receive the full benefit of our products, Moxa Internet Services has been set up to provide technical support, driver updates, product information, and user's manual updates.

The following services are provided

E-mail for technical support ..... support@moxa.com.tw

World Wide Web (WWW) Site for product information:

..... http://www.moxa.com

Problem Report Form

MOXA CA-132/132I Series

Customer name:	
Company:	
Tel:	**Fax:**
Email:	**Date:**

1. **Moxa Product:** ☐ CA-132 ☐ CA-132I
2. **Serial Number:** _____

Problem Description: Please describe the symptoms of the problem as clearly as possible, including any error messages you see. A clearly written description of the problem will allow us to reproduce the symptoms, and expedite the repair of your product.

Product Return Procedure

For product repair, exchange, or refund, the customer must:

- Provide evidence of original purchase.
- Obtain a Product Return Agreement (PRA) from the sales representative or dealer.
- Fill out the Problem Report Form (PRF). Include as much detail as possible for a shorter product repair time.
- Carefully pack the product in an anti-static package, and send it, pre-paid, to the dealer. The PRA should be visible on the outside of the package, and include a description of the problem, along with the return address and telephone number of a technical contact.